



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,550	05/26/2006	Romano Scllan	8455.015.US0000	5561
77213 7590 11/18/2008 Novak Druce + Quigg, LLP 1300 Eye Street, NW, Suite 1000 Suite 1000, West Tower Washington, DC 20005				
			EXAMINER	
			MCGUTHRY BANKS, TIMA MICHELE	
		ART UNIT		PAPER NUMBER
		1793		
		MAIL DATE		DELIVERY MODE
		11/18/2008		PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,550

Applicant(s)

SELLAN, ROMANO

Examiner

TIMA M. MCGUTHRY-BANKS

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 9-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

Claims 1 and 8 are currently amended, Claims 2-7 are as previously presented, and Claims 9-18 are withdrawn and currently amended.

Election/Restrictions

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 9-18 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vallomy (US 6,005,504) (Vallomy '504) in view of JP 08-005248.

Vallomy '504 teaches an improved control of a continuous electric arc furnace as shown below in Fig. 1 and 2:

Fig.1

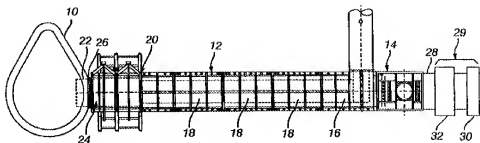
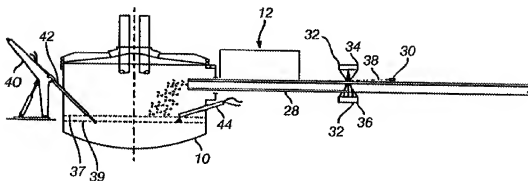


Fig.2



The system includes a preheating chamber 12 for introducing charge materials (column 3, lines 40-44). Fig. 2 shows the electrodes and hearth with a roof. The mass of materials introduced into the furnace and the temperature is determined (column 2, lines 38-60). However, Vallomy '504 does not disclose weighing the furnace periodically and detecting and regulating as in Claim 1.

JP '248 teaches a method of controlling an electric melting furnace without measuring a level of molten metal in the furnace or directly measuring a feed rate of molten metal. The

weight of the furnace body and the weight of raw materials supplied are continuously measured (abstract). The molten metal temperature is measured continuously [0007]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method of JP '248 in the process of Vallomy '504, since JP '248 teaches that the desired feed rate of molten metal can be obtained while variations in a level of molten metal are being prevented (abstract), and much more exact operation control is attained by measuring molten metal temperature [0008].

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vallomy '504 in view of JP '248 as applied to claim 1 above, and further in view of Gulden, Jr. et al (US 5,099,438).

Vallomy '504 in view of JP '248 discloses the invention substantially as claimed. However, Vallomy '504 in view of JP '248 does not disclose varying the electric power as in Claim 2, interrupting loading to the furnace before tapping for an interval of between about 8 and 12% of the overall time of the cycle as in Claim 3, interrupting the feed of electric power before tapping as in Claim 4, or increasing the minimum value of the electric power. Gulden, Jr. et al teaches a method for on-line monitoring and/or control of an electric arc furnace utilizing a method of data transfer between a programmable logic control and a microprocessor comprising monitoring data from the furnace over a fixed time cycle (abstract), as shown below in Figure 1:

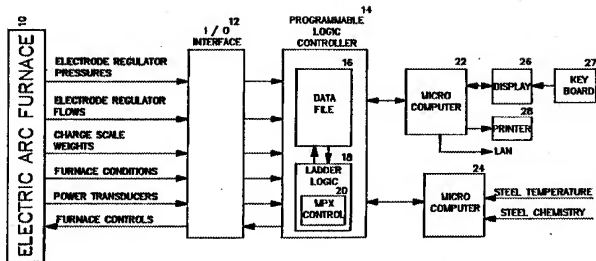


FIGURE 1

Table 5 shows the variation of the power in MW and MWhr. Vallomy '504 teaches that the operation of an electric arc steelmaking furnace can be an intermittent operation (column 1, lines 18-20). Charging and power input is interrupted for the tapping procedure (lines 31-34). Table 5 shows the time the heat was on for the entire process. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the monitoring and/or control process of Gulden, Jr. et al with the variation in power for loading and melting Vallomy '504 in view of JP '248, since Gulden, Jr. et al teaches that this monitoring and control process provides better control of the electrical energy required, provides better control of the consumable materials, provides better control of good steel making practices in operating the furnace, and provides quality control records of the entire process and the process parameters (column 2, lines 11-20). Specifically regarding the minimum and maximum electric power, Gulden, Jr. et al exemplifies minimum and maximum power usage in Table 5. Regarding the power variations, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which

achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation; therefore a *prima facie* case of obviousness exists. See MPEP § 2144.05 II B.

Regarding Claim 7, Vallomy '504 teaches that charging and power input is interrupted for the tapping procedure (column 1, lines 34-36).

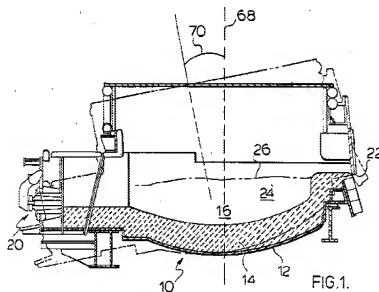
Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vallomy '504 in view of JP '248 and Gulden, Jr. et al as applied to claims 1 and 2 above, and further in view of Vallomy (US 4,564,388) (Vallomy '388), Hyde (US 3,772,000) et al, and Engledow (US 4,010,026).

Vallomy '504 in view of JP '248 and Gulden, Jr. et al discloses the invention substantially as claimed. Vallomy '504 further teaches that it is important to maintain a steel bath level that is neither too low not too high. Maintaining an appropriate heel level containing available heat results in immediate melting of metallic charge (column 1, line 66 to column 2, line 4). However, Vallomy '504 in view of JP '248 and Gulden, Jr. et al does not specifically disclose that the molten heel is 30-40% as claimed. Vallomy '388 teaches a molten heel of 40-50% (column 4, lines 57 and 58). Hyde teaches that if a low ratio of heel to new scrap is low, a greater net production of new steel per heat will result (column 7, lines 31-40). Engledow teaches that a hot-heel practice, that is, leaving a residue of molten metal behind in the furnace at the end of the first heat to start the next cycle. This eliminates the losses in both time and heat (column 3, lines 62-66). The claimed percentage of molten heel is an obvious design choice, since the prior art teaches that a molten heel is desirable in the process of melting a metallic charge such as scrap. A particular parameter must first be recognized as a result-effective

variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation; therefore a *prima facie* case of obviousness exists. See MPEP § 2144.05 II B.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vallomy '504 in view of JP '248 and Gulden, Jr. et al as applied to claims 1 and 2 above, and further in view of Wunsche (US 4,679,773).

Vallomy '504 in view of JP '248 and Gulden, Jr. et al discloses the invention substantially as claimed. Though Vallomy '504 in view of JP '248 and Gulden, Jr. et al teaches interrupting electric feed to the electrodes and restoring power to the electrodes, Vallomy '504 in view of JP '248 and Gulden, Jr. et al does not disclose the tapping steps a) - d) as claimed. Wunsche teaches an assembly for tapping liquid metal from an electric arc furnace as shown below in Fig 1.



The tapping assembly includes a refractory member having a tapping passage there through (column 2, lines 22-26). It is well known in the art that refractories have high melting points. The impulse jet can also be used to clean passage 34 of residual liquid metal or slag that may remain in passage 34 after discharge of metal (shown in Fig. 3) (column 4, lines 30-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the tapping method as taught by Wunsche in the method of Vallomy '504 in view of JP '248 and Gulden, Jr. et al, since Wunsche teaches that its process provides an essentially slag-free discharge of liquid metal, access to the tap hole can be readily and safely opened and closed, and a means for readily and safely displacing a temporary plug of refractory material from the tap hole, and for discharge of liquid metal from the furnace.

Response to Arguments

Applicant's arguments, with respect to the rejection(s) of claim(s) 1-8 under Vallomy '504 in view of JP '248 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Vallomy '504 in view of JP 08-005248.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit
1793

/T. M. M./
Examiner, Art Unit 1793
18 November 2008